

# Effects of Physical Noise on Instruction at One State University in Zimbabwe

Mukandi Cosmas

*School of Education, Technical Education Department, Great Zimbabwe University, Masvingo, Zimbabwe*

**Abstract:-** This study sought to find out levels of disruption of teaching and learning through the effects of environmental noise at one state university in Zimbabwe. Emphasis was placed on soliciting information from the affected stakeholders who are primarily the students and the lecturers. Two schools from amongst five which comprise the state university are located in the industrial site. However, only one school was chosen for study mainly because the researcher teaches in that school. An auto-ethnographic design was used to decipher data from the sample. Participant observation was employed by the researcher as he is equally affected by the circumstances. Purposive sampling was used to choose respondents from both student teachers and their lecturers. An early childhood development education honours degree second-year students were specially chosen because they are taught one module by the researcher and also because they use two venues for instruction. Lecturers who teach large groups in the school were included in the study. Closed and open-ended questionnaires for both lecturers and students were used to gather data for the study. Amongst other, results show that because of the location of the school myriad forms of physical noises are negatively affecting the instructional process. Study recommends that school either relocates to a more suitable environment or heavily invest in noise-proofing it's environ.

**Keywords:** physical noise; instructional process; communication; location.

## I. INTRODUCTION

All communication are immersed in noise. Communication noise is anything that disturbs or hinder smooth transaction of messages from sender to receiver. Noise is a variable in the communication process which cannot be controlled in most instances. Gorai & Pal (2006) define noise as audible acoustical energy that adversely affects, or may affect the physiological and psychological well-being of people. Myers, Mottet, & Martin (2000) describe noise as an obstacle that disturbs the flow of communication and as many factors that hamper the smooth flow of message from the sender to audiences. Rothwell, (2004) says forms of communication noise include psychological noise, physical noise, physiological and semantic noise. All these forms of noise subtly, yet greatly influence our communication with others and are vitally important to anyone's skills as a competent communicator. In all teaching and learning corridors across all levels, effective communication is in most cases emphasized. For effective communication to take place messages sent by the encoder must reach their destination in the same manner it was intended. But, is that process always

possible? Most of the data finesse is compromised along the way. One of the types of noises that compromise communication quality is physical noise. Wu and Newell (2003:58) describe physical noise as "*sounds and visual distractions that are present in the environment where the viewing takes place*". This type of noise can be called physical noise. Gordon and Browne (1989) postulates that environmental noise includes all the conditions that affects learner's surroundings. Two different sources of noise can influence the acoustic environment of the classroom: environmental noise and noise generated by the children themselves. The predominant external noise source, particularly in urban areas, is likely to be road traffic (Shield & Dockrell, 2002). Noise is measured in decibels (dB). Examples of physical noise include noise stimulated within the lecture room like pulling and pushing of furniture, background noises, acknowledging someone outside of the conversation, unsolicited responses, overcrowded lecture rooms, overly dim or bright lights, sounds from operation of projected media, extreme temperatures, spam and pop-up adverts amongst other examples. Then they are those examples of externally stimulated noises which include noises from vehicles passing, giggling and movements in the corridors, sounds of dripping water from the gutters or over-full jojo tank, sounds from the lawn-mower and so on and on. All the above examples can annoy and disrupt learning and teaching.

The school is located in the industrial area. Its neighbours comprise a bus garage, brick moulding company, junk metal yard, and panel-beating workshops amongst other enterprises. Heavy vehicles, construction vehicles, buses and saloon motor vehicles pass to and fro the industrial pass intermittently on routine tasks. On the opposite side of the school they is a highway which connects from this city to the next city which is a hundred kilometres away. It's equally a busy highway. It is an undisputable fact that the performance of any task which involves auditory cues may be deteriorated by physical noise. Poulton (1977) has claimed this situation to be true of almost all reported negative effects of continuous noise. Thus, according to him, these effects may be explained by the masking of auditory feedback or inner speech. Is the school masked from penetration of physical noise from outside?

Workers from industrial park shout wily-nilly, oblivious of the fact that instruction is proceeding within the parameters of the school. It is common knowledge that those involved in heavy-duty kind of work usually unnecessarily speak on top of their

voices to maintain motivation and rhythm in their work. Research in the early 1970s found that in schools around Heathrow Airport aircraft noise had a significant impact on teaching by interfering with speech and causing changes in teachers' behaviour in the classroom (Crook & Langdon, 1974). Excessive noise in the classroom can serve as a distraction and annoyance for teachers and learners alike (Dockrell & Shield, 2004). To address these concerns many countries have recently introduced or revised legislation and guidelines relating to the acoustics of schools, for example, Building Bulletin 93: Acoustic design of schools in the UK (Department for Education and Skills [DfES], 2003). Zimbabwean government also promulgated draft Environmental Management Act 13 of 2002 and Environmental Management Agency EMA (chapter 20:27). The purpose of such guidelines is to improve the teaching and learning conditions for learners and teachers in schools.

For effective learning and enhanced comprehension in classrooms, an adequate matrix of indoor environmental quality in terms of visual, acoustical and thermal conditions is required. Acoustics is one of the major criteria that dictate the functionality of a classroom, as vocal communication is the basic medium of instruction (Mir, & Abdou, 2006). The quality and intelligibility of speech in a classroom depends both on the level of noise and on the amount of reflected sound. Too much reflected sound degrades the quality of speech by increasing the noise level and masking speech. The reverberation time can be reduced by increasing the amount of acoustic absorption in the room, for example, by installing acoustic ceiling tiles, carpet or curtains (Dockrell, & Shield, 2006). Do the school's study and lecture theatres have vanguards against ricocheting of voices?

When learners have free slots on their daily time-table, they have no-where to go except milling around the school. Chit-chats along the corridors are rampant because of that. Usually apart from lecture rooms, school libraries are usually erected to encourage research and reading culture. Wireless network is assumed to be up and ubiquitous. Apart from libraries, learners also require refractories and parks where they can take time out to relax their minds from the heavy learning schedules. Is the school putting enough safety-nets for the learners to go through their varied programmes comfortably?

World over prior setting up an enterprise like an institution of higher and tertiary learning, some feasibility studies are usually conducted. One of the variables to consider is usually location. Location of a university can be determined after considering some principles of local governance and modern city designs. Noise can be economically reduced if the problem is identified during planning stage as it is expensive to apply abatement measures after the problem has been identified (Gorai & Pal 2006).

The study intends to find out the magnitude of physical communication hindrances affecting effective instruction at this selected university. Also to ascertain if the both parties

are aware of the varied examples of physical noises that affect instruction. Listed below are the objectives the study attempted to achieve:

- 1) Articulate forms of physical noise encountered during the instructional process
- 2) Examine whether the location of the school contribute to the perpetuation of physical noise
- 3) Suggest counter measures to highlighted forms of physical noise to improve instruction.

## II. RESEARCH DESIGN

An auto-ethnographic type of design was employed for this research. This design was especially chosen because the researcher is affected by the environmental noise during instruction and preparation of lessons. Auto-ethnography refers to an approach where the researcher's personal and reflective perspective is part of the analysis (Adams, Jones and Ellis, 2014). This design seeks to discover a true or authentic description of the world. Indeed, when a setting is familiar, the danger of misunderstanding is especially great. You should not assume that you already know other people's perspectives, because specific groups and individuals develop distinctive world views.

### *Sample*

Purpose sampling was used to sample both students and lecturers from the school at one state university in Zimbabwe. A total of one hundred and fifty students currently in their second year four year degree in Early Childhood Education honours programme and five lecturers were used in the sample. Lecturers who teach large classes (mass lectures) were chosen to participate in the research. The five lecturers chosen include the researcher. One large group of one hundred and fifty students the researcher teaches at the school were chosen as respondents for the research. This group of learners also conducts most of their lectures at a city venue, downtown.

### *Instruments*

Two instruments were used in this research namely participant observation and questionnaires. The researcher was a participant observer. The researcher is a lecturer at the school and teaches a module to the group of learners who are involved in this research. The researcher was equally affected by physical noise in the process of facilitation of instruction in all the sessions. Questionnaires were chosen and drawn for fellow lecturers and students. Closed and open ended questions were used. Questionnaires were preferred over other instruments because they give respondents time to ponder and reflect prior committing oneself on paper without being pressured by the presence of the researcher.

### *Data analysis procedure*

Data for the empirical research was collected by the researcher. The researcher is an active member of the school in research and teaching. The researcher meets the sampled

group of learners three hours every week for the duration of the semester. The effects of physical noise during instruction equally affects the researcher. The researcher compiled data after contact sessions with the group as evaluation of the sessions. The researcher used an observation guide which was completed after most of the sessions. On the questionnaires for students, off-session time was used to complete them. The researcher personally supervised the filling in and clarifications were made on hazy issues. Only 150 students came for the off-session from a possible total of 213. All the 150 issued out questionnaires were satisfactorily completed. Thematic approach was used to analyse collected data from both instruments.

### III. RESULTS

Effects of physical noise on instruction at one state university in Zimbabwe was the focus of this research. Data collected from questionnaires and participant observation was analysed and presented in thematic form. Bio-graphical data were not collected because the researcher assumed that physical noise

equally affects both sexes i-regardless of age, level of education and status at the university. As long as it occurs within the same environment whilst all are involved in a joint task.

The following themes were used to analyse data namely: negative effects of physical noise on instruction; location of school and space allocation within the school. Tables were also incorporated to improve analysis of the collected data.

#### *Negative effects of physical noise on instruction*

100% (150) student teachers and 100% (5) lecturers unanimously agree that physical noise negatively them during instruction in the lecture theatres. Both parties also unanimously agree that physical noise irritates them such that most cases they lose their focus and concentration diminishes likewise.

Listed below on Table 01 are examples of physical noises that can disrupt communication during instruction. Included are the percentages of concurrence on individual variables

Table 01

Variable	Students				Lecturers			
	Yes	No	Yes	No	Yes	No	Yes	No
Passing vehicles	140	93.3%	10	6.7%	5	100%	0	0%
Chit-chats in the corridors	140	93.3%	10	6.7%	5	100%	0	0%
Noises from neighbouring premises	100	66.67%	50	33.33%	5	100%	0	0%
Poor Wi-Fi connectivity	70	46.67%	80	53.33%	4	80%	1	20%
Overcrowded lectures	120	80%	30	20%	5	100%	0	0%
Echoes of the voices bouncing back	110	73.33%	40	26.67%	3	60	2	40%
Noise from projected media	55	36.67%	95	63.33%	0	0%	5	100%
Background noise from operation of computers	65	43.33%	85	56.67%	0	0%	5	100%
Pulling and pushing of furniture	150	100%	0	0%	5	100%	0	0%
Flipping of pages	135	90%	15	10%	4	80%	1	20%
Chorus answers	145	96.67%	5	3.33%	5	100%	0	0%
Poor lighting in the lecture room	35	23.33%	115	76.67%	3	60%	2	40%
Cell-phone ringing	140	93.3%	10	6.7%	5	100%	0	0%
Drowning tutor's voice in overcrowded room	140	93.3%	10	6.7%	2	40	3	60%
Poorly ventilated lecture theatre	55	36.67%	95	63.33%	2	40%	3	60%

The examples of physical noise mentioned above in Table 01 negatively affects student teachers in varied ways 40 say it affects effective communication. Whilst 60 students say they easily lose concentration in the disrupted section of the lesson. 10 students say because of noise by the time information gets to them it will have been distorted and 10 students felt that their ultimate goals of getting good grades were being compromised. The remaining 30 students gets demotivated

and irritated every time they get disrupted by forms of physical noise mentioned above.

3 lecturers felt that because of physical noise during instruction attention gets misdirected to the source of noise and 2 lecturers say instructional goals are compromised.

**Table 2** analyses the most irritating types of physical noises encountered in the instructional process by both lecturers and student teachers.

Variable	Number of students		Number of lecturers	
	Count	Percentage	Count	Percentage
Passing vehicles	50	33.3%	0	0%
Overcrowded lecture rooms	50	33.3%	0	0%
Pulling and pushing of furniture	30	20%	5	100%
Cell phone ringing	10	6%	4	80%
Drowning tutor's voice in an overcrowded room	10	6%	4	80%
Flipping pages	0	0%	1	20%
Poor Wi-Fi connectivity	35	23%	4	80%
Chorus answers	10	6%	0	0%
Chit-chats in the corridors	0	0%	5	100%

140 student teachers concur that the lecturer's voice is most not audible enough and only 10 say lecturer's voice projection is good enough. However, all 5 lecturers agree that their natural voices cannot sustain the one or two hour duration of the lecture as they are supposed to be shouting on top of their voices most of the time.

25 student teachers assume the lecturer's voice is curtailed because of some students misbehave in the lecture whilst 70 students think it is because of the overcrowded lecture theatre. 30 students felt that some of the lecturers' voice was too soft to be heard by the whole class. The remaining 25 students had nothing to say on the matter.

On possible solutions to reduce physical noise in the instructional process, student teachers' proposed several solutions. 30 students say the school should avail enough space and furniture for large classes. 5 students feel noise makers (class-mates) should be punished whilst 15 students felt that school regulations were in place but were not being effected for examples on cell phone ringing during session. 80 of the students strongly feel the school should be relocated away from the industry maybe back to main campus. 15 students advices the school to do away with mass lectures and 5 students felt that every lecture theatre can be installed with voice amplifiers and microphones. Meanwhile all lecturers agree that the group sizes can be reduced for meaningful learning to take place. They also felt that a fine for misbehaving in class can deter and reduce physical noise caused by the student.

#### *Location of the school*

The school is located in the industrial site, 4 lecturers expressed their discomfort with the location of the school. Whilst 15 student teachers' are happy with location of the school 135 students say the location is unsuitable. 135 of them felt that no meaningful learning can possibly take place in an industrial site which is also adjacent to a main road and 15 students say meaningful can smoothly proceed in spite of the

physical noise. Listed below are their summary of the location of the school:

- ❖ Too much physical noise
- ❖ Transport problems to and from school
- ❖ school far away from the library
- ❖ the environment is surrounded by noise
- ❖ It is a better environment than a city centre venue.

#### *Space allocation within the school*

From their experience, 145 student teachers say the school does not have enough space to accommodate their programmes. 120 students say they do not have rooms to use while they wait for next lectures, especially on their free slots and 30, say the rooms are there. 120 students felt that it is high time the school erected a refectory to reduce chit-chats in the corridors. The lecturers concur that the school does not have enough lecture space for the smooth running of all programmes.

85 of the student teachers' say they waste approximately 3 (three hours) daily waiting for the school buses to ferry them from home to city venue, then from city venue to industry venue and then the return trip like-wise. 35 students say they spent approximately 2 (two hours) for the same trips daily. The remaining 20 students are not affected by the transport blues. These movements equally affect the lecturers who have personally fund these round robin trips almost on daily basis.

All 150 respondents felt that movements from downtown to industry during learning time disorient and waste precious instructional time. 135 of them say all lectures should be conducted from one central position and 15 felt that it is still possible (the current arrangements) if efficient transport is provided.

## IV. DISCUSSION

Data was presented above using three themes and interpretation of the above analysis also used the same format.

Table 01 confirms that physical noise is at the school. It also highlights that different forms of affect both parties (lecturers and student teachers) differently. Noise from projected media has the sharpest contrast, all lecturers felt that noise from the operation of these gadget is insignificant whilst 43.33% of the students say noise from operation of these electronic gadgets disrupts communication. The lecturer is usually the one who operates the gadgets such that s/he is likely ignore this form of noise from the cooling fans because its unavoidable as long as the machine is switched on. Drowning lecturer's voice from an overcrowded lecture theatre is given prominence by the students (93.3%) because s/he is the one affected negatively and 40% of the lecturers concur with the students. Passing vehicles, chorus answers, flipping of pages, chit-chats in the corridors, noises from neighbouring premises, overcrowded lecture theatres and pulling and pushing of furniture are forms of physical noises commonly agreed upon by both parties as rich sources of noise that affects instructional process



negatively. All respondents both lecturers and student teachers unanimously pinpoint pulling and pushing of furniture as the sharpest physical noise experienced within the lecture rooms. Noise produces direct and cumulative adverse effects that impair health and that degrade social, working, and learning environments with corresponding real (economic) and intangible (well-being) losses. It interferes with concentration, communication, and recreation.

From table 2, 33.33% of the students felt that passing vehicles and overcrowded lecture rooms are the most irritating forms of physical noise whilst all lecturers think otherwise. This might imply that when the lecturer is busy delivering instruction certain noises have little or no effect whilst when the student is passively listening to the lecture his senses are more sensitive to certain noises like passing vehicles. Early research observed that teachers pausing during bursts of external noise leads effectively to a reduction in teaching time, sometimes estimating this loss to be as high as 11% of teaching time (Bronzaft & McCarthy, 1975). The overwhelming class sizes plus other forms of physical noise dilute the quality of instruction. The lecturer in many instances is forced to continuously speak on top of his voice. Raising one's voice results in vocal cord stress and then voice disorders (Gorai & Pal 2006). Studies conducted in the US found overwhelming evidence of voice fatigue being a particular health concern for teachers (Smith, Lemke, Taylor, Kirchner, & Hoffman 1988). Overcrowded rooms usually irritate and cause certain discomforts like breathing becomes very hot and this is usually accompanied by bad odour. All lecturers felt that chit-chats in the corridors during the instructional process is very irritating whilst all students felt otherwise. However, all respondents agree to varying percentages that poor Wi-Fi connectivity do irritate and disrupts the instructional process. Gorai & Pal (2006) explain that annoyance developed can be responsible for various types of physical and mental disturbances in people. Noise in high quantities can contribute to the rise in blood pressure, stress, vasoconstriction and increased incidence of coronary artery diseases (Muvavarirwa, 2015).

Results above indicate that generally the school is located in a noisy environment such that elements of physical noises encountered within the school and its immediate surroundings have negative effect to instruction. Noisy conditions have direct negative effects on learning, particularly language and reading development, as well as causing indirect problems to learners through distracting or annoying them (Woolner & Hall 2010).

On the location of the school the general feeling amongst all respondents is that the school is poorly located. Such that if Zimbabwe was a rich country simple solution was to relocate. Quality learning is compromised by certain forms of physical noises which are exacerbated by the location of the school. Concentration in lecturers' offices is erratic because of the physical noise. There is a great deal of very convincing evidence that in a school built next to a motorway or an

airport, there will be discernible impacts on learners' comprehension, language learning, attention and other cognitive functions (Stansfield, Berglund, Clark, Lopez-Barrio, Fischer, Öhrström, Haines, Head, Hygge, van Kamp, & Berry 2005).

On available learning space, all respondents concur that it is not enough. Students are having to shuttle between two venues and this daily unnecessary movements is causing anxiety. Lecturers are equally affected as the shuttling have financial implication at personal level. Students waste between two to three hours daily waiting for the shuttle buses. The amount of time wasted daily is not sustainable, the school should conduct all its business under one roof.

## V. CONCLUSION

This research focussed on revealing effects of physical noise on instruction at one state university in Zimbabwe. The researcher concluded that physical noise as one of the constituencies of communication noise negatively affects the instructional process at the school. However, in the African setting we say half a loaf is better than nothing.

### *Implications drawn from the study*

Basing from the findings highlighted above, if physical noise is to be reduced certain realistic changes may need to be incorporated which includes the following:

- ❖ Funds permitting offices and lecture theatres can be fitted with noise proof materials reduce physical noise from outside or relocate.
- ❖ Furniture may need to be transfixed to the floor to avoid pulling and pushing.
- ❖ All lecture theatres can be fixed with functional voice amplifiers.
- ❖ Reduction of mass group sizes to manageable ones.
- ❖ Improve Wi-Fi connectivity and accessibility.
- ❖ Furnish lecturers' offices to improve comfort and usability.
- ❖ Set up a refectory where students can refresh awaiting next lecture sessions and
- ❖ Set up school libraries for under and post graduates.

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